THE INSECT PEST SURVEY BULLETIN

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I N S E C T P E S T S U R V E Y B U L L E T I N

Vol. 4 April 1, 1924 No.1

OUTSTANDING ENTOMOLOGICAL FEATURES IN THE UNITED STATES FOR THE PERIOD FROM NOVEMBER 1, 1923, TO APRIL 1, 1924.

Last winter witnessed some entomological developments that are extremely significant to the Survey. The symposium on methods of estimating insect abundance and damage which occupied the attention of the American Association of Economic Entomologists at their annual meeting at Cincinnati brought out many interesting features of survey work. The papers were remarkable for the broad philosophical way in which the subject was handled and clearly indicated the rapid advance that is being made in basing entomological practice upon established scientific principles instead of empiricism.

The appointing of a committee to standardize methods of estimating insect abundance by this Association and the response which this committee has received from the members of the Association is enlightening, and will undoubtedly lead in the immediate future to the accumulation of a much more useful mass of data on this subject.

The winter was marked by notably cool weather over the greater part of the United States during October, followed in the latter part of the month by a warm spell. Precipitation as a rule was normal to below normal except in the northeastern States and Great Plains, unusually wet weather occurring in western Kansas. East of the Mississippi River the cool weather continued through November, while over the central valley and the Great Plains the weather was decidedly warmer and in the Dakotas it was the mildest recorded in 30 years. The Southwest had cold rainy weather during November while the Pacific Coast was experiencing a drought. December was unusually warm, the weather in some places in the New England States being the warmest ever recorded, while the end of the month brought some very cold weather in the Northwest and from the Great Plains westward. January witnessed extreme frost damage in the South Atlantic States when a very severe cold wave spread over this region on the 5th and 6th of the month. The Gulf region experienced similar cold weather, and but for cloudy weather serious damage would have been done in Florida. On the 2d and 3d of January very severe cold weather was felt in California, and during the month the entire western region was dry and the East wet. February started out mildly, but rapidly turned cold as the month advanced, severe freezing weather occurring in the South Atlantic, Gulf, and Florida regions, while the temperature in the Rocky Mountains and on the Pacific Coast was about normal.

The European corn borer made very slight increase in the infested territory in the western part of its distribution. On the other hand, two new infestations extend southward to Long Island, making a very material advance toward the southeastern corn belt.

The Hessian fly has appeared in rather alarming numbers in extreme western Kansas following three years of excess precipitation. Heretofore this region has been beyond the Hessian fly territory.

The unusually cold weather occurring over the Southern States appears to have materially affected the hibernation of the boll weevil in the Delta Region, as is shown by the examinations made at the Delta Laboratory of the Bureau, where the average number of live weevils per ton of moss was the lowest ever recorded, being 0.5. A full account of the records since 1915 appears in the body of this bulletin.

This severe weather so completely destroyed the remnants of the sweet potato vines and potatoes in the field that this, combined with a scarcity of sweet potatoes held by the farmers, has very materially reduced the number of sweet potato weevils in the infested territory.

A high percentage of eggs of the Australian tomato weevil in the rearing cages of the Bureau's Gulfport, Miss., Laboratory was destroyed by the freezing weather of March. Apparently the number of larvae and adults in the field was considerably reduced.

The outbreak of the potato tuber moth on the Eastern shore of Virginia, which developed last fall, extends well up into Accomac County. This is the first record of the occurrence of this insect as a potato pest in the Eastern United States.

An outbreak of the pepper weevil was brought to light in October in the La Habra district of California. Up to that time this pest was known only from about Mesilla Park in New Mexico and in southern Texas. Later investigations showed the pest well established in practically all commercial pepper-growing sections in Orange County and in the San Fernando Valley in California, one grower reporting a loss of $17,000 in last year's crop.

The discovery of the Oriental fruit moth in the vicinity of Valdosta, Ga., some 70 to 80 miles from the Fort Valley peach section is a matter of unusual interest. Active steps are being taken by the State Entomologist to eradicate the infestation if possible.

OUTSTANDING ENTOMOLOGICAL FEATURES FOR CANADA, NOVEMBER 1, 1923, TO APRIL 1, 1924

The winter of 1923-24 has been a very mild one throughout the greater part of the Dominion. The temperature, for the most part, has been well above normal with the exception of a cold snap in February throughout Eastern Canada.

The snowfall in the Western Provinces was light, the open range being almost free from snow late in February so that no feeding of stock was necessary. The snowfall in Ontario, Quebec, and the Maritime Provinces generally speaking was much heavier, the ground being well covered with a blanket of snow throughout the winter so that except in certain cases there was little frost in the ground.

On the whole, the winter has been a very favorable one both for crops and their insect enemies.

The European corn borer caused measurable losses to corn in 1923 over a much wider area than in the previous season, in the heavily infested sections of southern Ontario. In the control area the infestation increased by 10 per cent over 1922, although with this increase it is still 22 per cent lower than in 1921; the actual field losses in this area in 1923 were negligible. The very late spring which retarded the development of the borers by at least two weeks largely neutralized the good effects of late planting, as the effect upon the development of the crop was not nearly so marked. The mortality of corn borer larvae passing through the winter of 1922-23 was very light, the average being only 6.4 per cent both above and below ground. Eight new townships were found infested during the season, bringing the total up to 170, covering an area of 13,266 square miles. An extensive control campaign is under way, the farmers being circularized and visited to encourage them in cleaning up corn refuse in every farm before June 1.

Grasshopper prevalence during the coming year will chiefly center in southern sections of Alberta and Saskatchewan, the species of most importance being Melanoplus atlanis Riley. The severe outbreak of Camnula pellucida Scudd., which has been present in the Nicola Valley, British Columbia, for the past two years, is now on the decline; while in the Okanagan Valley, B. C., 1924 will constitute the peak year of infestation, with M. atlanis, M. packardii Scudd., and M. bivittatus Say as the most prevalent species.

The beet-root aphid, Pemphigus betae Doane, was found during 1923 to be generally distributed throughout the entire Lower Fraser Valley of British Columbia. An evaluation of the economic status of this insect is under consideration for the coming season.

The wheat-stem sawfly, Cephus cinctus Nort., remains the major wheat pest in Manitoba, and is now present throughout the entire wheat-growing area of the Province over one-third of which it has caused considerable damage. The parasite Microbracon cephi Gahan is steadily on the increase.

Continued outbreaks of the rose chafer are expected to occur in many of the light sandy sections of southwestern Ontario during the coming season.

Owing to the favorable overwintering conditions many vineyards in the Niagara District of Ontario will probably be badly infested by grape leafhoppers, Erythroneura comes Say. and E. tricincta Fitch, during 1924.

The cutworm Euxoa excellens Grt. was very numerous in southern sections of Vancouver Island, B. C., during 1923, damage being done to a variety of field and garden crops. Large numbers of the larvae were destroyed by a wilt disease, and by parasites last autumn.

Outbreaks of the cankerworms are expected to occur in several of the counties around the western shores of Lake Ontario during the coming season.

Many trees in the orchards of southwestern Ontario are heavily infested with the San Jose scale, a general increase being observed.

Several districts in Nova Scotia which in the past were important breeding centers of the brown-tail moth have been found to be clear of infestation. Up to February 2, the number of nests collected was the smallest since the insect was first discovered in 1907, 75 per cent being taken in the locality of Bridgetown where great efforts are being made to eradicate the pest.

Eggs of the green apple aphid are at present abundant on the twigs of young trees in many apple orchards of southwestern Ontario.

The tussock caterpillar Halisidota tesselaris S. & A. appeared in immense numbers in southwestern Ontario during the late summer and fall of 1923, attacking various trees and shrubs, and doing considerable injury to apple orchards. This insect was abundant throughout eastern Canada, but it is not yet possible to forecast accurately the probable extent of its occurrence during the coming season.

C E R E A L A N D F O R A G E - C R O P I N S E C T S

MISCELLANEOUS FEEDERS

GRASSHOPPERS (Acrididae)

Texas — C. H. Gable (January 21): The grasshopper situation appears quite alarming to me. Mr. Russell, at my suggestion, has made rather an extensive examination of grasshopper eggs in northern Texas and finds that from 85 to 95 per cent are now in good hatchable condition. He gathered practically two 5-pound candy boxes full of egg masses in a very short time. He states that "in some places as many as a dozen masses were found within 5 or 6 inches."

WHEAT

HESSIAN FLY (Phytophaga destructor Say)

Michigan — R. H. Pettit (March 10): We have quite a bit of Hessian fly infestation scattered in places where sowings were made before the fly-free date.

Illinois — W. P. Flint: Abundant rains throughout the late summer and early fall of 1923 caused a heavy growth of the volunteer wheat in stubble fields throughout the State. This wheat is moderately to heavily infested with the Hessian fly and will provide sufficient spring adults for a moderately heavy infestation in the spring of 1924. In the sown fields there is very little infestation present except in the southwestern part of the State, where a number of fields were seeded early. The infestations in these fields will run from 60 to 90 per cent.

Nebraska — M. H. Swenk (March 12): Organized campaigns to await the date of safe seeding of winter wheat, as announced by the Department of Entomology of the Nebraska Experiment Station, were conducted in 11 counties that showed a heavy infestation and experienced considerable losses during the spring of 1923. These organized counties were Cass, Otoe, Johnson, Richardson, Douglas, Saunders, Colfax, Seward, Fillmore, Buffalo, and Furnas. On the basis of the field observation station conducted at Plattsmouth, Cass County, in the fall of 1923, dates of safe seeding were announced for these counties, according to location, from September 29 to October 4. Subsequent checks in several of these counties showed that the wheat seeded on or after the announced date of safe seeding was free from infestation. In most of these counties a high percentage of the

farmers awaited the announced date of safe seeding, and as a result these counties that contained so much heavy infestation by the fly in the spring showed comparatively little of it in the fall. In other counties, unorganized, where the Hessian fly had not done enough injury in the spring of 1923 to indicate that organized effort to secure a general delay until the date of safe seeding, would be successful, the present infestation is more severe than it was a year ago. The organized campaign in Furnas County was not successful, for a comparatively small percentage of the farmers awaited the date of safe seeding, and as a result the infestation there is much increased at this time as compared to a year ago, except in the case of the small percentage of farmers who actually awaited the safe date before seeding their wheat. This area of heavy infestation in Furnas County extends even more heavily west into Redwillow County and east into Harlan County, thence less heavily, but still seriously, into Phelps and Gosper Counties and the southern part of Dawson County. Another center of serious infestation is in Jefferson County and the southern part of Gage County, and this extends northward into Saline and Fillmore Counties. Other counties from which reports of seriously injured fields have been received are Webster, Butler, Dodge, and Sarpy Counties. In brief, the geography of the Hessian fly infestation at this time is different from that of a year ago chiefly in that the counties that were worst infested a year ago are now comparatively lightly infested, while the present heavy infestation, except in Furnas County, is in counties that were not heavily enough infested a year ago to secure general interest in a program of late seeding.

CHINCH BUG (Blissus leucopterus Say)

Ohio — H. A. Gossard (March 22): There are very few chinch bugs to be found in the State and we are not expecting much trouble from them.

Illinois — W. P. Flint: No very extended examination of chinch bug hibernating quarters has been made up to this time. Those made thus far indicate about the average winter mortality in the central Illinois counties with a rather high mortality, in some cases as high as 50 per cent, in the northern counties. These counties are just becoming infested with the bugs. Present indications are that there are enough chinch bugs in hibernation to cause moderate to heavy damage to susceptible crops throughout the central and north-central counties of Illinois during the coming season. A more careful chinch bug survey will be conducted during the next two months.

Missouri — L. Haseman (March 12): In spite of severe winter on March 7 examination of clump and blue-grass harbors in sheltered places show live bugs abundant. They were observed in short and scattered grass shelters. Protection seemed poor, though, on south slope. This leads me to believe that we will have chinch bug trouble again this summer.

GREEN BUG (Toxoptera graminum Rond.)

New Mexico — R. Middlebrook (March 11): As yet we have received no reports of the green bugs which usually at this time are reported from the eastern part of our State in large numbers.

PALE WESTERN CUTWORM (Porosagrotis orthogonia Morr.)

New Mexico — J. R. Horton (March 8): The first outbreak of this cutworm in New Mexico occurred last year, discovered a month or so later than this season. Worms were reared through to the moth and identified. They feed entirely below the surface of the soil, cutting off the wheat stem or mining out the central shoot for one-quarter to 1 inch of its length. The attack is most severe on late sown winter wheat, a single bite or two destroying the single shoot. When destroyed wheat is followed up with row crops, these are also attacked and destroyed. The damage was first seen this year about February 20.

CORN

EUROPEAN CORN BORER (Pyrausta nubilalis Huebn.)

Ohio — H. A. Gossard (March 22): The European corn borer has survived with no great amount of mortality in the cornstalks in the infested counties.

A STALK BORER (Diatraea lineolata Walk.)

New Mexico — R. Middlebrock (March 11): The infestation was not very severe, being about 2 in 100 stalks in some fields, but running as high as 5 per cent in other fields. However, this valley is not the center of the worst infestation, which occurs along the eastern quarter of this State. There is some doubt as to whether this is lineolata or zeacolella.

ARMYWORM (Cirphis unipuncta Haw.)

Mississippi — H. W. Allen (March 12): Quite a number of Cirphis unipuncta have been found under board traps in crimson and burr clover.

CLOVER

CLOVER-LEAF WEEVIL (Hypera punctata Fab.)

Mississippi — H. W. Allen (March 12): We are finding many larvae of what I suppose to be Hypera punctata, under board traps in burr clover. The larvae are in several instars, but up to the present date no pupae or adults have been found.

SORGHUM

SORGHUM WEBWORM (Celama sorghiella Riley)

Missouri — L. Haseman (March 12): Overwintering caterpillars were recently found harboring in great numbers in the pith of broom corn stored for broom making. Some damage to the corn was reported, due to the tunneling of the larvae close up to the brush. This is a new record as to winter harbors of the pest.

F R U I T I N S E C T S

APPLE

GREEN APPLE APHID (Aphis pomi DeG.)

Oregon — A. L. Lovett (March 14): This is the first hatching date observed. There have been an unusually open winter and early spring. They appear above average from two limited observations.

ROSY APPLE APHID (Anuraphis roseus Baker)

Connecticut — W. E. Britton (March 24): A few eggs were found around fruit spurs of the apple at Milford, Middlefield, Middlebury, Cannondale, and South Glastonbury, which we take to be Anuraphis roseus Baker.

Oregon — A. L. Lovett (March 12): There have been an unusually open winter and early spring. The data have to do primarily with the hatching date. They may have started a day or two before observed. They appear above average with insufficient data.

WOOLLY APPLE APHID (Eriosoma lanigerum Hausm.)

Connecticut — Philip Garman (March 24): Galls of the woolly aphid on apple twigs were received from many parts of the State.

CODLING MOTH (Carpocapsa pomonella L.)

New Mexico — R. Middlebrook (March 11): Codling moths are in large numbers.

RASCAL LEAF-CRUMPLER (Mineola indiginella Zell.)

California — H. S. Smith (March 19): The rascal leaf-crumpler has been discovered for the first time in California by H. J. Ryan, County Horticultural Commissioner of Los Angeles County. It was thought at first that the pest was so limited in its distribution that eradication might be a possibility, but further inspection showed it to be so widespread in Los Angeles County that there was no hope of exterminating it.

TENT CATERPILLAR (Malacosoma americana Fab.)

Massachusetts — A. I. Bourne (March 24): The apple tent caterpillar, which for the last two or three years has been on the increase, gradually approaching the top of its characteristic wave of abundance, is apparently, from all indications we can find at present, still on the increase. This is particularly true even in the western part of the State where its returning abundance was first noted, so that we can not apparently expect any great decrease in its numbers this season. Naturally we would expect the first signs of returning to a minimum abundance to be from that section of the State. Here in Amherst, early spring indications gathered from the egg masses are for a greater abundance of this species than last year. Mr. Fiske, of Lunenburg, in northern Worcester County, would estimate, from his personal observations, about 30 per cent more egg masses on his place than he found last year. The same is reported by Mr. Calkins, another prominent grower of the same general region. The egg masses are found in considerable numbers, even in well sprayed orchards, where of course they will not be allowed to increase to numbers enough to cause any serious injury once the season opens and the regular spray program is begun to be put in practice, but this increased abundance over last year in these well-cared-for orchards is a very good indication of the general upward trend of the pest.

Connecticut — W. E. Britton (March 24): Egg clusters of Malacosoma americana Fab. were found on apple and wild cherry twigs everywhere throughout the State. They were more abundant than in an average year.

FALL WEBWORM (Hyphantria cunea Drury)

New York — E. P. Felt and M. D. Leonard (December 6, 1923): Several infestations at Chazy and Chateaugay were evidenced by old nests which occurred on neglected apple trees.

SPRING CANKERWORM (Paleacrita vernata Peck)

Missouri — L. Haseman (March 12): Male moths have been fairly abundant coming to lights since March 5 at Columbia. This probably indicates that we may expect some cankerworm trouble this spring.

FALL CANKERWORM (Alsophila pometaria Harr.)

Connecticut — W. E. Britton (March 24): Males of Alsophila pometaria were exceedingly abundant around trees on warm days of November and December. They were more abundant than in an average year.

Leslie Rogers (November 14, 1923): At New Haven, great numbers of these insects were flying about a grove of oak trees on a hillside. The abundance was almost double that in an average year.

BUFFALO TREEHOPPER (Ceresa bubalus Fab.)

New York — P. J. Chapman (March 12): Injured apple twigs were received from Armonk.

New Mexico — R. Middlebrook (March 18): Damage by the buffalo treehopper is found in the eastern section of our State, but the damage is not severe, except in some very young nursery stock.

BROWN-TAIL MOTH (Euproctis chrysorrhoea L.)

Massachusetts — A. I. Bourne (March 24): From the main fruit growing sections within the area of the brown-tail moth infestation, I find that the condition in regard to this insect, judged from the overwintering tents, would appear to point to a very light infestation. Mr. Fiske of Lunenburg reports that in his orchard he has not been able to find any winter nests at all. Another grower, Mr. Farrar of South Lincoln, found 20 nests in 1,200 young bearing apple trees. The infestation is scattered, and there are apparently now and then points where it has still retained something of a foothold, but contrasted with this are many other sections where it is apparently practically extinct.

GIPSY MOTH (Porthetria dispar L.)

Massachusetts — A. I. Bourne (March 24): In regard to the gipsy moth in bearing orchards, at least the indications are for a very light infestation. In Essex County, in the northeastern section of the State, the report is that the egg masses are distinctly less numerous than last year. On the other hand, in western Middlesex County, the egg masses are very few compared with the last few years.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Ohio — H. A. Gossard (March 22): There is very little San Jose scale injury in the State. Mr. Houser has been scouting all over the State for the past two or three weeks trying to locate some orchards suitable for experimental use. He has located one near Painesville where the scales are plentiful and in excellent healthy condition. The mortality among them has not been high.

Indiana — J. J. Davis (March 24): The San Jose scale is the most important insect problem at the present time and there will be a large amount of oil emulsion used in the southern half of the State.

B. A. Porter (Winter 1923-1924): The following mortality records were taken in the same section of the same orchard at intervals during the winter. The trees were of the J. H. Hale variety of peach, and in fairly vigorous condition. In the spring of 1923 in the same orchard the mortality on the Elberta variety was 28 per cent. In making counts, only the partially grown scales were

counted. The very small scales and those which were about mature were disregarded, as in this locality all of these perish during the winter. The figures, therefore, represent the mortality among the scales which would have survived under favorable conditions.

	Number of scales.			Per cent dead.
Date.	Live.	Dead.	Total.	
Dec. 5	867	201	1068	17.9
Jan. 14.	745	321	1066	30.1
Jan. 22	733	367	1100	33.4
Feb. 8	344	208	552	37.7
Feo. 19	545	475	1020	46.6
Mar. 12	498	502	1000	50.2

Illinois — W. P. Flint: The winter temperature has been below normal during one or two periods throughout the entire State. Official records of from 4 to 2. degrees below zero have been reported at many points in the State. At Anna, in the southern part of the State, about 75 per cent of the hioernating stages of the scale were alive the latter part of November and the first of December. At the present time 40 to 45 per cent of the scale in this stage is alive, showing a winter mortality of about 30 per cent.

Missouri — L. Haseman (March 12): The scale is very bad in several orchard sections but careful spraying is holding it very well. The winter mortality at Columoia was about 75 per cent in some counts as compared with 25 per cent last winter. This will surely be a factor in scale control this year. Overwintering scales during a recent warm spell showed slight signs of growth or activity.

New Mexico — R. Middlecrock (March 11): The San Jose scale is about as prevalent as usual.

OYSTER-SHELL SCALE (Lepidosaphes ulmi L.)

Michigan — R. H. Pettit (March 10): The oyster-shell bark-louse is probably worse than it has been in many years.

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

New York — E. P. Felt and R. D. Leonard (Decemoer 6, 1923): A small apple tree was observed at Chazy, which had been killed by the attack of this insect.

EUROPEAN RED SPIDER (Paratetranychus pilosus C. & F.)

Massachusetts — A. I. Bourne (March 24): The situation in regard to the European red mite is somewhat hard to define. From our observations, the pest has now reached well across the State. Its line of advance has oeen, however, roughly toward the northeast rather than

straight across the State so that we now find it pretty generally over Worcester, Middlesex, and Essex Counties. Few, if any, reports have been made of finding it in the southeastern area of the State. This advance has been widespread so that the infestation is very generally distributed throughout orchards, but in northern and northeastern Worcester County, as a general thing, the infestation is not particularly heavy as yet, except in some isolated cases, and of course it is confined chiefly to its principal host, the Baldwins. One grower who has pruned his orchard of 1,000 MacIntosh trees failed to notice any evidence of its presence, while Baldwins in blocks alongside showed quite heavy infestation. Here at the College, for two or three years in practically all of the blocks of apples, we have had the pest in considerable abundance, particularly on Baldwins. Last year, as I mentioned, the foliage by the middle of August was bronzed so that it became very conspicuous. However, examination during the winter season failed to disclose any amount of overwintering eggs. The same was true of practically our whole planting of apples. Our sole infestation of any consequence is apparently limited to our main block of plums which is a variety block containing a considerable number of trees. here the infestation is light to fairly heavy, showing an apparent preference of the mites for certain varieties. According to reports from Connecticut, this should largely be attributed to predacious forms as the last year, here in Amherst at least, was particularly favorable to the development and multiplication of the mites. I may say that we were somewhat surprised to note this condition of things here at the College following such a marked infestation last year, although our observations throughout the State in the last few years have called our attention to somewhat similar, although less marked cases. That this is a purely local matter, confined principally to our own orchards, is borne out by the fact that some of the large growers to the south of us, just north of the Holyoke range, are finding the pest so abundant that they are contemplating special oil sprays for its control. It would appear, from our experience here, that it is very difficult to make any general statement regarding infestation by this species, it being apparently a matter of individual orchards, to a very large extent.

Connecticut — Philip Garman (March 24): The European red mite is quite abundant in the northern part of the State. Eggs are more abundant than last year.

Virginia — W. J. Schoene (March 25): Eggs are very abundant on dormant apple twigs at Winchester.

GRAPE

SNOWY TREE-CRICKET (Oecanthus niveus DeG.)

Missouri — L. Haseman (March 18): Grape men at Boonville and Neosho are complaining of an unusual crop of eggs of this pest in their young grape canes used for cutting.

GRAPE LEAFHOPPER (Erythroneura comes Say)

New Mexico — R. Middlebrook (March 11): Mr. Emory reports that many of the grape leafhoppers are present.

PHYMATODES AMOENUS SAY

Massachusetts — A. I. Bourne (March 24): There is one other brief item which has come to our attention here, and which may be of some slight interest. Early in February, during the course of pruning in the vineyard at the College, a section of cane from a weakened vine was brought down to the office as there had been found one or two specimens of apparently coleopterous larvae in the case. We succeeded in finding a larva and pupa, which were very evidently coleopterous and which we forwarded to Dr. A. G. Böving for identification. He identified this as the larval and pupal stages of Monophylla terminata Say, a clerid which is predacious on certain other forms, notably Phymatodes amoenus, and which is reported as very plentiful on dry wood attacked by Sinoxylon. Later we bred something like 20 adults of Phymatodes amoenus from this small section of cane which was scarcely 10 inches long. Still later, about the first of March, several specimens of a red-shouldered Sinoxylon, Sinoxylon basilare Say, emerged from this same section. This is interesting as giving a record of the breeding of two of Say's species from the same canes, and also of the finding of a predacious form of another of Say's species from the same source. Apparently from our study of literature on the subject both the Phymatodes and Sinoxylon are purely secondary in the nature of their injury, being attracted to weakened, dying canes in which they hasten the death and decay of the vine.

CITRUS

CITROPHILUS MEALYBUG (Pseudococcus gahani Green)

California — H. S. Smith (March 19): The so-called citrophilus mealybug is spreading with extreme rapidity in the citrus orchards of southern California. This insect was first discovered in 1913 in an orchard at Uplands. For a number of years the pest was more or less confined to this area along with an infestation near Pasadena and another in the San Francisco Bay district. Less than two years ago, however, an outbreak was found in Orange County and since that time it has spread until now it covers an area of over 7,000 acres of orchards in parts of which it is doing severe damage to the citrus trees. Biological control work is, however, being carried on on a large scale and with great success. Much inconvenience is experienced by packinghouses and bi-product plants on account of the necessity of restricting the distribution of picking boxes and other orchard appliances in an attempt to prevent its further distribution.

TRUCK-CROP INSECTS

MISCELLANEOUS FEEDERS

GARDEN SLUG (Agriolimax agrestis L.)

Oregon — A. L. Lovett (1923-1924): This slug is always a serious pest of gardens and ornamentals, but destructiveness to field crops appears on the increase. Vetch is heavily attacked, as are tangier peas and clover. No real check on losses, but injury is general and in occasional fields very high, being practically present all winter and at the present time at Junction City, Corvallis, and western Oregon.

CABBAGE

CABBAGE WEBWORM (Hellula undalis Fab.)

Alabama — F. L. Thomas (March 20): One adult observed on March 8.

STRAWBERRY

STRAWBERRY CROWN-BORER (Tyloderma fragariae Riley)

Missouri — L. Haseman (March 18): Inspectors report many fields held up due to last year's brood of borers in southwestern Missouri. No records taken on overwintering adults at this time.

STRAWBERRY ROOT WEEVIL (Brachyrhinus ovatus L.)

Washington — J. E. Graf (March 1): Letter from R. D. Bodle Company, Seattle, Washington, dated February 21, advising in part that in their vicinity some four to five thousand acres of strawberries are produced, and nearly all of them are affected with the strawberry root-weevil. They have done everything to try and get rid of them, but with no success.

STRAWBERRY ROOT LOUSE (Aphis forbesi Weed.)

Alabama — F. L. Thomas (March 20): Eggs of this insect hatched by the middle of February.

BEANS

MEXICAN BEAN BEETLE (Epilachna corrupta Muls.)

GENERAL STATEMENT — Neale F. Howard (1922-1923): The records of the spread of the Mexican bean beetle for the past season have been obtained almost entirely through the cooperation of the State

entomologists or entomological workers in States where spread is recorded. The most noteworthy spread has been to the north, in Ohio, where it occurs as far north as Columbus, in Franklin County. This most northern infestation of which we have a record is about 150 miles from the most northern infestation which was recorded a year ago, viz., in Fayette County, Kentucky. It is believed that the insect spread at least 100 miles to the north during last season. The spread eastward in North Carolina, as determined by Prof. Franklin Sherman and coworkers, is also quite remarkable, the insect having spread about 75 miles from the most eastern point known to be infested last year and over 100 miles from the infestation recorded in Swain County last year. The spread eastward in South Carolina has also been quite extended, as shown by the records of Prof. A. F. Conradi and Mr. J. A. Berly. It is quite likely that the infestation extends from Grayson County in Virginia to Bland County, although no records are available, and it is also quite likely that the infestation extends from Mercer County in West Virginia across to Mason County on the Ohio River, although no records are available in this case. The only spread to the west recorded in 1923 are the one in Meade County, Ky., reported by Prof. H. Garman, and the infestation in Itawamba and Tishomingo Counties in Mississippi, reported by Prof. R. W. Harned and coworkers. To the south, the only records of spread we have are the one from Lee County, Ala., where it was found by Dr. F. L. Thomas, and from Lamar County, Ga., (formerly a part of Pike County), reported by the County agent and Mr. Gill, of the Bureau. Careful search for the beetle in southern Illinois and Indiana have been made by Messrs. W. P. Flint and J. J. Davis, of those States, and the beetle has not been found.

Alabama — F. L. Thomas (March 20): No large colonies have been found because of the comparatively small fall infestation, but a half dozen specimens have been found, all of which were alive.

New Mexico — R. Middlebrook (March 11): The bean beetle was found in hibernation still viable. It seems also to have withstood the winter. Owing to the fact that there has been a severe drought for the last three years, I am informed that very few beetles remain in hibernation in the bean growing sections of the dry part of the State.

CUCUMBERS

WESTERN 12-SPOTTED CUCUMBER BEETLE (Diabrotica soror Lec.)

Oregon — A. L. Lovett: Observed insects in flight near Corvallis February 24. Report from Coos County on February 28, of injury to gardens and ornamentals. Found at Corvallis feeding on clover March 2.

STRIPED CUCUMBER BEETLE (Diabrotica vittata Fab.)

New Mexico R. Middlebrook (March 21): Diabrotica vittata is now emerging and does not seem to have suffered from the unusually severe winter.

TWELVE-SPOTTED CUCUMBER BEETLE (Diabrotica 12-punctata Oliv.)

Mississippi H. W. Allen (March 12): A few adult Diabrotica 12-punctata have been noted on green weeds and in oats and rape.

POTATO

POTATO TUBER MOTH (Phthorimaea operculella Zell.)

Virginia Herbert Spencer (Nov. 11, 1923): The outbreak of the potato tuber moth on the Eastern Shore of Virginia extends well up into Accomac County. Careful scouting during the last two weeks has established the region of maximum damage to be between Eastville and Exmore. South of Eastville larvae of the insect were found in fewer numbers as far down the peninsula as Kiptopeke. North of Exmore the survey is still unfinished, but larvae have been taken at Coley, Onancock, Parksley and Bloxom. At the last place only one larva was found by five inspectors, who looked over many fields.

The Eastern Shore of Virginia Produce Exchange, which handles practically all of the potatoes of the district, has agreed not to sell any seed from Virginia, or ship any, until January 1, 1924. By that time the condition of stored home-grown seed with respect to tuber worm infestation can be easily determined by their inspectors. No infested seed will be accepted by the exchange for shipment.

A tuber moth campaign has been planned and started in the affected region by the Virginia Truck Experiment Station. Arrangements have been made to fumigate most of the home-grown seed before planting time. To date two storage houses of a combined capacity of 250,000 cubic feet have been treated.

SQUASH

SQUASH LADY-BEETLE (Epilachna borealis Fab.)

Alabama F. L. Thomas (March 20): Forty-three adults received from Chambers County. These had been hiding under the bark of an old pecan tree.

SOUTHERN FIELD-CROP INSECTS

COTTON

BOLL WEEVIL (Anthonomus grandis Boh.)

GENERAL STATEMENT

B. R. Coad (March 17): The regular annual examinations which have been made by the Delta Laboratory for the past ten years to determine prospects of the boll weevil emergence in the spring have just been completed. In making these records each year the same fifteen selected points in northern Louisiana have been used to represent the different types of hibernation conditions found in that district. A total of over 4000 pounds of Spanish moss was collected from these points and examined carefully for live and dead weevils. From these records the ratio of both live and dead weevils per ton of moss is computed, in order to get a comparative numerical expression, and past experience has shown that this gives a fair index to the spring emergence which may be expected. The records for the past ten years are given in the following table:

Year	Live Weevils per ton of moss	Dead weevils per ton of moss
1915	10.0	414.0
1916	24.0	136.0
1917	8.0	144.0
1918	1.7	46.9
1919	4.0	53.0
1920	9.5	15.8
1921	22.0	26.0
1922	127.0	2.2
1923	19.0	42.0
1924	0.5	63.4

It will be noted from the above tabulation that the number of live weevils in the moss this year is exceedingly low, thus indicating a probable low emergence from hibernation in the coming spring. However, it should also be remembered that these figures represent only an approximation of conditions and have only a comparative value in a very general way. For example, the record is somewhat lower than that indicated for 1918, but the opposite would be indicated by the temperature records, since in the winter of 1917-1918 the absolute minimum at Tallulah was 1 (one) above zero, while in the 1923-1924 it was 10 (ten) above zero. The weevils in hibernation in the fall of each of those years seem to have been somewhat similar, and it is quite probable that as far as the Tallulah neighborhood is concerned the emergence will be much the same. Field observations during the summer of 1918 showed a sufficient emergence of weevils in the spring to cause serious damage to the cotton crop, and the low injury of that year was more due to the drought of the summer than to the low emergence of weevils.

The above figures indicate that the farmers will have a very good crop chance at the outset this year in the district represented by the Tallulah examination at least, but the final outcome of the crop still depends largely on the summer weather conditions, and no one should relax in the weevil fight on the basis of the prospect of light weevil infestation, because sufficient weevils will still emerge to do serious damage with a normal or unfavorable summer. Furthermore, it should be remembered that the above figures do not necessarily apply to the entire cotton belt, and each district should bear in mind the minimum temperatures they have experienced during the winter and figure accordingly. Also the type of shelter available is exceedingly important, as these records are taken in the northern portion of the zone in which Spanish moss is found, and during cold winters a heavier mortality is found in this zone than in the somewhat more northerly sections where the weevils secure better shelter.

Oklahoma — E. E. Scholl (March 18): A general snowstorm of the last few days has delayed the emergence of insects in Oklahoma. There was some activity of boll weevils before this cold spell struck Oklahoma but at the present time there is very little to report.

SUGAR CANE

SUGAR-CANE BORER (Diatraea saccharalis Fab.)

Louisiana — Monthly Letter of the Bureau of Entomology, No.118, February, 1924: L. L. Janes, of the Bureau of Agricultural Economics, cooperating with T. E. Holloway and W. E. Haley of the Bureau of Entomology, estimates the normal loss to sugar-cane in Louisiana due to the sugar-cane moth borer to be 570 pounds of sugar per acre. The loss for 1922 is estimated at 510 pounds, and for 1923 at 690 pounds. The borer is responsible for similar damage in Florida, Mississippi, and Texas, and it also seriously injures corn, broomcorn, kafir, etc.

F O R E S T A N D S H A D E - T R E E I N S E C T S

MISCELLANEOUS FEEDERS

WHITE-MARKED TUSSOCK MOTH (Hemerocampa leucostigma S. & A.)

Illinois — W. P. Flint: Egg masses of the tussock moth are more numerous than usual in cities in the northern half of Illinois. The infestation is not as heavy as that occurring in some localities during the past outbreaks of this insect, but is more general than any outbreak which has occurred in the last ten years. Collections made in the vicinity of Chicago and at Urbana showed a very small percentage of parasitism in the eggs.

FOREST TENT CATERPILLAR (Malacosoma pluvialis Dyar and M. disstria Huebn.)

Oregon — Don C. Mote (March 5): The tent caterpillars, Malacosoma pluvialis and M. disstria, will probably be common but not sensationally abundant this season. A partial survey of the region which was heavily infested last year yielded 160 egg masses in about three hours with four persons scouting. Although alder and willow are the major host plants, they contained very few overwintering egg masses, following excessive defoliation of last spring. Most of the egg rings were found on vine maple (Acer circinatum) which apparently had not been attacked the previous season. A microscopical examination of the egg masses yielded the following data:

Caterpillars	172
Undeveloped	397
Egg parasites	81
Total eggs examined	650

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

New Mexico — R. Middlebrook (March 11): The bagworms are more numerous than usual.

ELM

EUROPEAN ELM SCALE (Gossyparia spuria Modeer)

Nex Mexico — R. Middlebrook (March 11): The European elm scale is increasing in the northern part of this State.

MAPLE

PIGEON TREMEX (Tremex columba L.)

New York — E. P. Felt and M. D. Leonard (December 6): Sugar maples in Champlain, Chateaugay, Messena, Moira, and Bombay were all more or less badly affected with the pigeon horn-tail and showed evidence of the work of the attending parasite Thalessa.

SUGAR-MAPLE BORER (Glycobius speciosus Say)

New York — E. P. Felt and M. D. Leonard (December 6,1923): Observed rather commonly in Champlain, Chateaugay, Messena, Moira, and Bombay, New York. Many sugar maples in these towns are in a dying or greatly weakened condition from the attacks of this pest.

BOXELDER PLANT-BUG (Leptocoris trivittatus Say)

District of Columbia — Wm. Middleton: The boxelder plant-bug has been an annoying house guest in the neighborhoods of Sheridan Circle and Georgetown, Washington, D. C.

GLOOMY SCALE (Chrysomphalus tenebricosus Comst.)

Alabama — Wm. Middleton: The gloomy scale has been reported by N. F. Howard, of Truck-Crop Insect Investigations, in injurious quantities on maples during the past year at Birmingham.

POPLAR

FALL CANKERWORM (Alsophila pometaria Harr.)

New York — E. P. Felt and M. D. Leonard (December 6,1923): Female found on poplar trunk.

Ohio — H. A. Gossard (March 22): Mr. C. F. Irish, a landscape gardener of Cleveland, reported to us that the cankerworm moths were seen coming up about the first week in March. No field work has yet commenced.

COTTONWOOD SCALE (Chionaspis orthobobis Comst.)

New Mexico — R. Middlebrook (March 11): Cottonwood scale was found abundantly on some trees in this valley.

WILLOW

WILLOW APPLE-GALL (Pontania pomum Walsh)

New York — E. P. Felt and M. D. Leonard (December 6,1923): Galls abundant on willows at Chateaugay and Champlain.

RUSTY TUSSOCK MOTH (Notolophus antiqua L.)

New York — E. P. Felt and M. D. Leonard (December 6,1923): An egg mass on willow at Chateaugay.

I N S E C T S A T T A C K I N G

G R E E N H O U S E A N D O R N A M E N T A L P L A N T S

CHRYSANTHEMUM

CHRYSANTHEMUM GALL-MIDGE (Diarthronomyia hypogaea F.Loew)

Illinois — Charles C. Compton (March 6): There has been a severe outbreak of the chrysanthemum gall-midge in a greenhouse at Aurora.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

District of Columbia — Wm. Middleton: The euonymus scale is present in injurious quantities in one section of Washington, D. C.

ARBORVITAE

ARBORVITAE LEAF-MINER (*Argyresthia thuiella* Pack.)

GENERAL — Wm. Middleton: The arborvitae leaf-miner is increasing about Washington, D. C., injuring arborvitae at the Arlington National Cemetery, Va., and in Chevy Chase.

BOXWOOD

BOXWOOD LEAF-MINER (*Monarthropalpus buxi* Labou)

Connecticut — W. E. Britton (November 23, 1923): A few box plants are badly infested at Waterford.

District of Columbia — Wm. Middleton: During the past year the boxwood leaf-miner has become established in some locations in Washington, D. C., and promises to be a serious pest.

I N S E C T S A T T A C K I N G M A N A N D D O M E S T I C A N I M A L S

MAN

CASTOR-BEAN TICK (*Rhodes ricinus* L.)

Oregon — Don C. Mote (February 15): Two ticks taken at Mohler, Tillamook County, from the neck of a man. Specimens determined by Don C. Mote, and verified by Dr. Ransom.

CATTLE

OX WARBLE (*Hypoderma lineatum* DeVill.)

Illinois — Charles C. Compton (February 12): The ox warble is not as abundant in cattle this winter as during the past three years.

H O U S E H O L D P E S T S A N D I N S E C T S I N J U R I O U S T O S T O R E D P R O D U C T S

TERMITES (*Reticulitermes flavipes* Kol.)

Michigan — R. H. Pettit (March 10): This insect is becoming more and more abundant in Michigan everywhere and it is attacking buildings in our cities more and more commonly. A few

weeks ago we examined into a case of a very serious infestation in Battle Creek where a large building was seriously injured at one of the food factories. Shortly after that a good sized boarding house, or what amounts to a flat building, in Grand Rapids was attacked. We are just planning to visit Paw Paw to look into a bad case in a dwelling house, and so it goes. New cases coming in all the time.

Indiana — J. J. Davis (March 24): It is rather interesting to note that we are already receiving reports of white ant destruction as far north as Logansport. This pest is becoming quite a serious one in Indiana.

Missouri — L. Haseman: Several reports have been received recently from different localities showing serious damage to timbers, rugs, and other materials in homes.

BEAN WEEVIL (Mylabris obtectus Say)

Michigan — R. H. Pettit (March 10): The bean weevils is gradually spreading over the State. This is important, since Michigan produces more white beans than any other State in the Union and most of Michigan heretofore has been free from the weevil. This fact led us to put on a campaign last fall against this pest.